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HOUSE OF REPRESENTATIVES
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GOWANUS CREEK CHANNEL, N. Y.

LETTER

FROM

THE SECRETARY OF THE ARMY

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, UNITED STATES ARMY, DATED SEPTEMBER 19, 1950, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS, ON A REVIEW OF REPORTS ON GOWANUS CREEK CHANNEL, N. Y., REQUESTED BY A RESOLUTION OF THE COMMITTEE ON RIVERS AND HARBORS, HOUSE OF REPRESENTATIVES, ADOPTED ON MARCH 19, 1946

JANUARY 8, 1952.—Referred to the Committee on Public Works and ordered to be printed, with two illustrations

LETTER OF TRANSMITTAL

DEPARTMENT OF THE ARMY,
Washington, D. C., January 10, 1951.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated September 19, 1950, from the Chief of Engineers, United States Army, together with accompanying papers and illustrations, on a review of reports on Gowanus Creek Channel, N. Y., requested by a resolution of the Committee on Rivers and Harbors, House of Representatives, adopted on March 19, 1946.

In accordance with section 1 of Public Law 14, Seventy-ninth Congress, the views of the State of New York are set forth in the enclosed communication.

Although the Bureau of the Budget advises that there is no objection to the submission of the report to Congress, it states that any estimate of appropriation for the initiation of this project, if authorized by Congress, must be justified in accordance with the policy set forth

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in the President's letter to the Secretary of the Army dated July 21, 1950, concerning curtailment of civil public works. The complete views of the Bureau of the Budget are contained in the attached copy of its letter.

Sincerely yours,

FRANK PACE, Jr.
Secretary of the Army.

COMMENTS OF THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D. C., December 15, 1950.

The honorable the SECRETARY OF THE ARMY,
(Through the Budget Officer for the Department of the Army.)

MY DEAR MR. SECRETARY: Receipt is acknowledged of your letter dated October 4, 1950, submitting the proposed report of the Chief of Engineers on Gowanus Creek Channel, N. Y., requested by resolution of the Committee on Rivers and Harbors, House of Representatives, adopted March 19, 1946.

I am authorized by the Director of the Bureau of the Budget to advise you that there would be no objection to the submission of the report to Congress.

The President, in his letter to you dated July 21, 1950, directed that all civil public works be considered with the objective, as far as practical, of deferring, curtailing, or slowing down those projects which do not directly contribute to defense or to civilian requirements essential to the changed international situation. Therefore, any estimate of appropriation for the initiation of the project, if authorized by the Congress, must be justified in accordance with the policy set forth in the President's letter referred to above or any modification thereof.

Sincerely yours,

WM. F. MCCANDLESS,
Assistant Director, Estimates.

COMMENTS OF THE STATE OF NEW YORK

STATE OF NEW YORK,
DEPARTMENT OF PUBLIC WORKS,
Albany, August 17, 1950.

Maj. Gen. LEWIS A. PICK,
Chief of Engineers, Department of the Army,
Office of the Chief of Engineers, Washington, D. C.

DEAR GENERAL PICK: This will acknowledge, with thanks, receipt of your letter of August 11, 1950, enclosing a copy of the proposed report of the Chief of Engineers, together with the reports of the Board of Engineers for Rivers and Harbors and of the district and division engineers, on a review of reports on Gowanus Creek Channel, N. Y.

It is noted that you concur in the views and recommendations of the Board. This department has no comment to make on the subject at this time.

Very truly yours,

B. D. TALLAMY,
Superintendent of Public Works.

REPORT OF THE CHIEF OF ENGINEERS, UNITED STATES ARMY

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., September 19, 1950.

Subject: Gowanus Creek Channel, N. Y.

To: The Secretary of the Army.

1. I submit herewith for transmission to Congress the report of the Board of Engineers for Rivers and Harbors in response to resolution of the Committee on Rivers and Harbors of the House of Representatives, adopted March 19, 1946, requesting the Board to review the reports heretofore submitted on Gowanus Creek Channel, N. Y., with a view to determining if it is advisable to modify the existing project in any way at this time.

2. After full consideration of the reports secured from the district and division engineers, the Board recommends modification of the existing project for Gowanus Creek Channel, N. Y., to provide for deepening the existing 26-foot channel to 30 feet at mean low water, including extension of the deepened channel about 500 feet into the existing 18-foot channel and widening of the channel at the junction with the existing 40-foot project of Bay Ridge and Red Hook Channels, and for a branch channel 30 feet deep at mean low water and 150 feet wide in the lower 1,000 feet of Henry Street Basin, all generally in accordance with the plans of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, at an estimated cost to the United States of $287,000 for construction and $1,500 annually for maintenance in addition to that now required, subject to the condition that local interests give assurances satisfactory to the Secretary of the Army that they will: (*a*) Provide without cost to the United States all lands, easements, and rights-of-way for the construction and maintenance of the project, when and as required; (*b*) deepen the approaches and berths at the ship terminals in order to secure the full advantages of the deeper channels; and (*c*) hold and save the United States free from damages due to the construction works; and also subject to the condition that no dredging shall be done by the Federal Government within 50 feet of any wharf or structure unless a waiver of damage is signed by all parties having an interest in such wharf or structure or by the port authority or other financially competent agency.

3. After due consideration of these reports, I concur in the views and recommendations of the Board.

LEWIS A. PICK,
Major General,
Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

DEPARTMENT OF THE ARMY,
BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., June 20, 1950.

Subject: Gowanus Creek Channel, N. Y.
To: The Chief of Engineers, United States Army.

1. This report is submitted in response to the following resolution adopted 19 March 1946:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports heretofore submitted on Gowanus Creek Channel, New York, with a view to determining if it is advisable to modify the existing project in any way at this time.

2. Gowanus Creek is a tidal waterway on the east side of upper New York Bay, in the borough of Brooklyn, about 4 miles by water southeast of the Battery, New York City. It extends 1.8 miles northeasterly from the north end of Bay Ridge Channel in Gowanus Bay and includes the 1-mile upper portion known as Gowanus Canal which local interests have improved to depths ranging from 12 feet at the lower end to 7 feet at the head. The lower part of Gowanus Creek has been improved by the United States under a project known as Gowanus Creek Channel. The locally dredged Henry Street Basin enters Gowanus Creek Channel from the north, 750 feet upstream from the lower end of the Federal project. This basin, about 2,000 feet long and 200 feet wide, has depths decreasing from 21 feet in a strip 100 feet wide in the lower 1,000 feet of the basin to 5 feet at the head. The mean range of tide in Gowanus Creek Channel is 4.7 feet. The improvement authorized by Congress provides for a channel 26 feet deep at mean low water from Bay Ridge Channel at Twenty-eighth Street to the foot of Percival Street, with the width decreasing from 300 feet at Twenty-eighth Street to 200 feet at Percival Street, and thence 18 feet deep at mean low water to the Hamilton Avenue Bridge, gradually decreasing in width to 100 feet at the bridge. The project was completed in 1904. The cost to June 30, 1949, was $140,122 of which $70,000 was for new work and $70,122 was for maintenance. The latest approved estimate of annual cost of maintenance is $6,000. Local interests have expended approximately $6,000,000 in developing water-front terminals and berthing facilities in the section of Gowanus Creek under consideration. Insufficient depth in the 26-foot section of the waterway precludes efficient operation of the larger deep-draft vessels and, during high tide, congestion is aggravated with the concentration of deep-draft vessels taking advantage of the additional depth of water. Depths in the Henry Street Basin are insufficient to accommodate the cargo ships and tankers that use, or expect to use, the basin.

3. The tributary area includes the boroughs of Brooklyn, Queens, Manhattan, and Bronx, of the City of New York, with a combined population of 7,965,000 in 1949, and to some extent parts of Nassau and Suffolk Counties. The area in the immediate vicinity of Gowanus Creek Channel has excellent transportation facilities. Commodities are distributed locally by truck, from the water terminals, over a network of highways and bridges to points in New York City and Long Island. Two large shipyards on the Gowanus Creek 26-foot

channel are engaged in the repair of all types of vessels from many ports, including the latest type of ocean-going tankers and cargo vessels. Commerce of Gowanus Creek Channel and Canal, including Henry Street Basin, for the 25-year period to and including 1947 averaged about 4,000,000 tons annually with a minimum of about 3,000,000 tons in 1923 and a maximum of about 5,000,000 tons in 1930, excluding tonnages of the section below Twenty-eighth Street. During the period 1924 to 1941, the average annual commerce consisted of 2,500,000 tons transported to and from Gowanus Canal and 1,500,000 tons handled in the section below the head of the 18-foot channel. During the years prior to the late war, the commerce consisted of petroleum products, coal, grain, ores, sugar, cocoa beans, and general cargo. In addition, car ferry traffic handled in the 26-foot section during the period 1924 to 1947 averaged 97,400 tons annually. During 1946 and 1947, vessels drawing 26 feet or more made 208 trips in Gowanus Creek Channel, including 36 trips by vessels with drafts between 28 and 30 feet and 29 trips by vessels with drafts between 30 and 32 feet. During 1947, vessel traffic in Henry Street Basin included nine out-bound trips of steamers drawing from 28 to 30 feet. During 1948, the two shipyards repaired 917 vessels consisting of 240 cargo ships, 29 tankers, and 648 harbor craft and ocean-going tugs. Commerce carried in deep-draft vessels over the waterway during the year 1948, exclusive of that of Gowanus Canal, is estimated at 1,227,400 tons for the 26-foot channel including 79,700 tons for Henry Street Basin. Prospective annual commerce to be carried in deep-draft vessels is estimated at 1,317,000 tons which includes for the Henry Street Basin 68,000 tons of grain, 12,000 tons of general cargo, and 90,000 tons of lumber.

4. Local interests desire deepening of the existing 26-foot and 18-foot channels in Gowanus Creek to 30 feet to a line opposite the upper end of the Colonial Sand & Stone Corp. bulkhead; and dredging of a branch channel in Henry Street Basin, 30 feet deep and 100 feet wide for a distance of 1,000 feet, thence 15 feet deep and 100 feet wide to the head of the basin. They claim that the improvement would produce annual benefits estimated at $525,000, consisting of $100,000 from the elimination of delays in waiting for tides, $50,000 from elimination of additional costs in shipment of grain resulting from moving of partially loaded deep-draft vessels to other terminals to permit loading to capacity, and $375,000 from elimination of lighterage costs on general cargo received along the present 18-foot channel. Several commercial interests state that they would dredge their slips and strengthen their bulkheads if required because of the greater depth in the channel. No other offer of local cooperation is made.

5. The district engineer finds that the most suitable plan of improvement provides for deepening the existing 26-foot project of Gowanus Creek Channel to 30 feet at mean low water, including extension of the deepened channel about 500 feet into the 18-foot project, and widening of the channel at the junction with the existing 40-foot project of Bay Ridge and Red Hook Channels; and for a branch channel 30 feet deep and 150 feet wide in the lower 1,000 feet of Henry Street Basin. He states that existing depths in the upper part of Henry Street Basin are adequate for the type of vessels using that part of the basin. The cost is estimated at $428,000 of which $287,000 is Federal, consisting of $227,000 for enlarging the main channel and

$60,000 for dredging the channel in Henry Street Basin; and $141,000 is non-Federal, consisting of $116,000 and $25,000 for deepening the approaches and berths along the Gowanus Creek and Henry Street Basin Channels, respectively. The Federal annual cost of maintenance is estimated at $1,500 in addition to that now required, all for the channel in Henry Street Basin. The annual carrying charge is estimated at $18,670 of which $13,770 is for Gowanus Creek Channel and $4,900 is for the channel in Henry Street Basin. The district engineer states that the improvement would relieve congestion on the waterway by spreading the traffic of deep-draft vessels throughout the day instead of only during the hours of high tide, and would eliminate the hazards of grounding. It would also facilitate access to the new grain pier of the Port of New York Authority and another pier along the Henry Street Basin. Based on present commerce carried in deep-draft vessels, the annual savings from elimination of delays are estimated at $36,500 for Gowanus Creek Channel and $6,000 for the channel in Henry Street Basin. The indicated benefit-cost ratio is 2.65 for Gowanus Creek Channel, 1.22 for the channel in Henry Street Basin, and 2.28 for the total improvement. He concludes that the further improvement of the project is justified and therefore recommends it subject to the conditions that local interests provide without cost to the United States all lands, easements, and rights-of-way for the construction and maintenance of the project, when and as required; deepen the approaches and berths at the ship terminals in order to secure the full advantages of the deeper channels; and hold and save the United States free from claims for damages as a result of the improvement. The division engineer concurs.

6. Local interests were informed of the recommendations of the reporting officers and invited to present additional information to the Board. Careful consideration has been given the communications received.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

7. The Board of Engineers for Rivers and Harbors concurs generally in the views and recommendations of the reporting officers. The improvement would relieve congestion in the Gowanus Creek Channel and provide suitably for the needs of deep-draft navigation both in that waterway and in the Henry Street Basin. The anticipated benefits are considered sufficient to justify the expenditure required for the work.

8. Accordingly, the Board recommends modification of the existing project for Gowanus Creek Channel, N. Y., to provide for deepening the existing 26-foot channel to 30 feet at mean low water, including extension of the deepened channel about 500 feet into the existing 18-foot channel and widening of the channel at the junction with the existing 40-foot project of Bay Ridge and Red Hook Channels, and for a branch channel 30 feet deep at mean low water and 150 feet wide in the lower 1,000 feet of Henry Street Basin, all generally in accordance with the plans of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, at an estimated cost to the United States of $287,000 for construction and $1,500 annually for maintenance in addition to that now

required, subject to the condition that local interests give assurances satisfactory to the Secretary of the Army that they will: (*a*) Provide without cost to the United States all lands, easements, and rights-of-way for the construction and maintenance of the project, when and as required; (*b*) deepen the approaches and berths at the ship terminals in order to secure the full advantages of the deeper channels; and (*c*) hold and save the United States free from damages due to the construction works; and also subject to the condition that no dredging shall be done by the Federal Government within 50 feet of any wharf or structure unless a waiver of damage is signed by all parties having an interest in such wharf or structure or by the port authorities or other financially competent agency.

For the Board:

J. S. BRAGDON,
Brigadier General, Chairman.

REPORT OF THE DISTRICT ENGINEER

SYLLABUS

Deepening of the existing 26-foot project, Gowanus Creek Channel, N. Y., including extension of the deepened channel about 500 feet into the existing 18-foot project, and provision of a branch channel of the same depth and 1,000 feet long in Henry Street Basin would eliminate delays presently encountered by deep-draft vessels in waiting for suitable tidal heights, reduce congestion on the waterway during periods of high tide, and reduce accidents due to grounding. The magnitude and general nature of these benefits justify further improvement of the waterway by the United States.

The district engineer recommends that the existing project be modified to provide for deepening the existing channel to 30 feet at mean low water, including extension of the deepened channel about 500 feet into the existing 18-foot channel and widening of the channel at the junction with the existing 40-foot project of Bay Ridge and Red Hook Channels, and for a branch channel 30 feet deep and 150 feet wide in the lower 1,000 feet of Henry Street Basin, designated as plan 1 on accompanying maps, at an estimated first cost to the United States of $287,000 with annual maintenance of $1,500 in addition to that required under the existing project, subject to the conditions of local cooperation contained in paragraph 73.

CORPS OF ENGINEERS, U. S. ARMY,
OFFICE OF THE DISTRICT ENGINEER,
NEW YORK DISTRICT,
New York 5, N. Y., July 29, 1949.

Subject: Review of Reports (Survey) on Gowanus Creek Channel, N. Y.

To: The Division Engineer, North Atlantic Division, Corps of Engineers, Federal Office Building, Room 1216, 90 Church Street, New York, N. Y.

1. *Authority.*—The Committee on Rivers and Harbors of the House of Representatives adopted the following resolution on March 19, 1946, authorizing a review of reports on Gowanus Creek Channel, N. Y.:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports heretofore submitted on Gowanus Creek Channel, New York, with a view to determining if it is advisable to modify the existing project in any way at this time.

2. The Chief of Engineers, Department of the Army, in third endorsement dated April 8, 1946, requested the division engineer, North Atlantic Division, to submit the report. The division engineer

assigned the work to the district engineer, New York district, on April 10, 1946.

3. A partially favorable preliminary report was submitted by the district engineer on April 30, 1947. The views and recommendations of the district engineer were concurred in by the division engineer on June 20, 1947. The report recommended a survey of Gowanus Creek Channel limited to consideration of deepening the existing 26-foot project, extending this deepened channel about 500 feet upstream into the existing 18-foot project and provision of a branch channel of the same depth extending 1,000 feet into Henry Street Basin. The Board of Engineers for Rivers and Harbors reviewed the preliminary report, and on September 11, 1947, recommended a survey of Gowanus Creek Channel to determine the advisability and cost of improvement and the local cooperation required. The survey as recommended by the Board of Engineers for Rivers and Harbors was authorized by the Chief of Engineers in letter to the division engineer dated September 15, 1947, and the duty of making the survey was assigned to the district engineer on September 25, 1947.

4. *Scope of survey.*—The scope of this survey as authorized by the Chief of Engineers on September 15, 1947, is limited to the consideration of deepening the existing 26-foot project channel, extending this deepened channel about 500 feet upstream into the existing 18-foot project channel and provision of a branch channel of the same depth extending 1,000 feet into Henry Street Basin. A hydrographic survey of Henry Street Basin and probings in the basin and in Gowanus Creek Channel were made in March 1949 to supplement a condition survey of the waterway made in March 1948. (See accompanying map, fig. 2.) The United States Coast Guard, the department of public works, State of New York, the Port of New York Authority, the department of marine and aviation, city of New York, the office of the president, Borough of Brooklyn, and commercial interests concerned were consulted in connection with the proposed improvements. (See pars. 55 and 64.)

5. *Reports under review.*—The reports under review pertaining to the waterway which is now designated as Gowanus Creek Channel are described in table 1.

TABLE 1.—*Reports under review*

Authority	Type of report	Where published	Remarks
Sec. 2 of the River and Harbor Act approved June 14, 1880, authorized an examination or survey or both, at "Gowanus Bay, N. Y."	Survey	H. Ex. Doc. No. 48, 46th Cong., 3d sess.	The officer in charge, in report to the Chief of Engineers dated Jan. 11, 1881, submitted an estimate of cost for a channel 18 feet deep at mean low water and 200 feet wide from the 18-foot contour outside Gowanus Bay to the Hamilton Ave. drawbridge, except for the upper few hundred feet near the drawbridge where it gradually narrows to 100 feet. Submitted to Congress by the Secretary of War on Jan. 20, 1881. Adopted by the River and Harbor Act of Mar. 3, 1881.
River and Harbor Act approved Aug. 2, 1882, authorized an examination or survey, or both, at "Gowanus Creek at Brooklyn, N. Y."	Preliminary	S. Ex. Doc. No. 30, 48th Cong., 1st sess.	The officer in charge, in report to the Chief of Engineers dated Dec. 18, 1882, stated that Gowanus Canal was not worthy of improvement. Submitted to Congress by the Secretary of War on Dec. 20, 1883.

TABLE 1.—*Reports under review*—Continued

Authority	Type of report	Where published	Remarks
Sec. 17 of the River and Harbor Act approved Sept. 19, 1890, authorized an examination or survey, or both, at "Buttermilk Channel and Gowanus Bay channels in New York Harbor, with a view to straightening the same by removing the shoals opposite the southeast side of Governors Island, protecting the channels by a sea wall on Governors Island, and to provide for the full width thereof a uniform depth of 26 feet at mean low water throughout these channels along the wharves of Brooklyn from a point opposite Wall Street Ferry to the foot of Bryant St., Brooklyn."	Preliminary	H. Ex. Doc. No. 26, 51st Cong., 2d sess.	The Chief of Engineers, in report to the Secretary of War dated Dec. 1, 1890, concurred in the views of the district officer that Gowanus Bay was not worthy of improvement to the extent contemplated or proposed to be effected by the act. Submitted to Congress by the Secretary of War on Dec. 2, 1890.
	Annual report	Annual report of the Chief of Engineers for 1887, p. 712.	The Chief of Engineers in annual Report for 1887 stated that the dimensions of the then existing project for Gowanus Bay channels were too small and that the channels should be increased to 21 feet at mean low water and to a width of 400 feet. The River and Harbor Act of Aug. 11, 1888, authorized the improvement of the channel from the foot of Percival St. to opposite the entrance to Erie Basin, to a depth of 21 feet at mean low water and a width of 400 feet.
Sec. 9 of the River and Harbor Act approved June 3, 1896, authorized a survey and estimate of cost of improvement at "Gowanas (Gowanus) Creek, with a view to obtaining a depth of 30 feet at mean low water."	Survey	H. Doc. No. 336, 54th Cong., 2d sess.	The Chief of Engineers, in report to the Secretary of War dated Mar. 1, 1897, submitted an estimate for deepening Gowanus Creek Channel from the foot of Percival St. to its junction with Red Hook Channel from 26 feet, which was authorized by the River and Harbor Act of June 3, 1896, to 30 feet at mean low water. Submitted to Congress by the Secretary of War on Mar. 2, 1897.
Sec. 12 of the River and Harbor Act approved Sept. 22, 1922, authorized a preliminary examination and survey at "Gowanus Creek Channel from the foot of Percival Street to Hamilton Ave., Brooklyn, N. Y., with a view to deepening the same to 26 feet at mean low water."	Preliminary	Not published	The Chief of Engineers, in report to the Secretary of War, dated Dec. 8, 1923, concurred in the views of the district engineer and the Board of Engineers for Rivers and Harbors, that improvement of Gowanus Creek Channel from the foot of Percival St. to Hamilton Ave., to 26 feet at mean low water, was not deemed advisable at that time.

6. *Description.*—See maps figures 1 and 2 herewith; also United States Coast and Geodetic Survey Charts Nos. 369 and 541, United States Coast and Geodetic Survey air photo compilation sheets Nos. T–5460 and 5461, the Brooklyn and Staten Island quandrangles of the United States Geological Survey and the Brooklyn and Jersey City quandrangles of the Corps of Engineers, United States Army.

7. Gowanus Creek is a tidal waterway located on the east side of Upper New York Bay, in the Borough of Brooklyn, about 4.0 miles by water southeast of the Battery, New York City. It extends from the north end of Bay Ridge Channel in Gowanus Bay, in a northeasterly direction for a distance of 1.8 miles, including the upper portion known as Gowanus Canal. The creek was originally narrow and

winding and extended through salt meadows from the head of Gowanus Bay. It had a drainage area of about 2 square miles. In the development of Brooklyn, the marshes have been filled and the banks of the creek modified and altered to correspond with the street lay-out.

8. The lower portion of Gowanus Creek has been improved by the United States under a project now known as Gowanus Creek Channel. This project provides for a channel 26 feet deep at mean low water from Bay Ridge Channel at Twenty-eighth Street to the foot of Percival Street with width decreasing from 300 feet at Twenty-eighth Street to 200 feet at Percival Street, and thence 18 feet deep at mean low water to the Hamilton Avenue Bridge, gradually decreasing in width to 100 feet at the bridge. (See pars. 18 to 20 for description of existing project.) The total length of the improved section is 0.8 mile. The controlling depth as determined in March 1948 was generally the same as the project depths except near the edges of the channel. The total available width between pierheads varies from 520 feet at Twenty-eighth Street to 400 feet at Percival Street. The section of the waterway between Percival Street and Hamilton Avenue, 1,100 feet long, has been bulkheaded on both sides along the harbor lines, leaving an open waterway which narrows from 300 feet at the lower end to 120 feet at Hamilton Avenue.

9. The portion of the waterway beyond the limit of the Federal project at Hamilton Avenue, known as Gowanus Canal, has been improved by local interests. It extends a distance of 1.0 mile with a width of 100 feet. The canal, together with five branch basins, is maintained by the various commercial interests located along the waterway, to a depth ranging from 12 feet at mean low water at the lower end to 7 feet at the upper end. The city of New York also dredges the canal at storm sewer outfalls to depths of 10 to 12 feet about once every 3 years. The canal is crossed by five movable and three fixed bridges, with minimum horizontal clearance of 36 feet and minimum vertical clearance of 20 feet.

10. A major branch, known as Henry Street Basin, enters Gowanus Creek Channel from the north, 750 feet upstream from the lower end of the Federal project. This basin is about 2,000 feet long and 200 feet wide. The controlling depths, as determined in March 1949, are 21 feet for a 100-foot width along the center of the basin from the entrance to a point 1,000 feet upstream, thence 17.5 feet for a similar width a distance of 700 feet, and thence 5 feet at the upper end of the basin. Henry Street Basin is used extensively by the Port of New York Authority in connection with the operation of its grain terminal located on the west side of the basin.

11. The mean range of tides in Gowanus Creek Channel is 4.7 feet, with spring tides reaching 5.6 feet. Irregular fluctuations due to wind and barometric pressure vary from 3.9 feet below to 9.0 feet above mean low water. United States harbor lines have been established up to the upper limit of the Federal project at Hamilton Avenue, and in Henry Street Basin. For a large portion of the waterway the bulkhead and pierhead lines are combined. The waterway is open to navigation throughout the year.

12. Gowanus Creek Channel connects directly or indirectly with all the channels and water routes included within the Port of New York, and with all inland, coastal and ocean routes served by the port. It

is centrally located with respect to numerous water-front and railroad terminals and yards along the adjacent Brooklyn shore on Upper New York Bay. The lower end of the Gowanus Creek Channel project joins with the existing 40-foot Federal project for Bay Ridge and Red Hook Channels.

13. *Tributary area.*—The area immediately tributary to Gowanus Creek Channel includes the Boroughs of Brooklyn, Queens, Manhattan, and Bronx of the city of New York and to some extent parts of Nassau and Suffolk Counties. Many states and foreign countries may also be considered tribuary to Gowanus Creek Channel. Petroleum products are generally received from Texas, Louisiana, and Venezuela by ocean-going tankers and distributed throughout the tributary area by truck or barge. Coal is received from Virginia and the Pennsylvania mines and Jersey City railroad terminals, by ocean-going ships and car floats, and distributed by truck. Lumber is received from the west coast. The waterway also serves extensive commercial terminals for the handling and storage of general cargo which is received from or shipped to all parts of the world. Grain and grain products are shipped from the Middle West by way of the Great Lakes, the Erie and Oswego Canals and the Hudson River, direct by water or by rail-water combination to the Port of New York Authority grain terminal and then shipped to all parts of the world. There are also two large shipyards located on Gowanus Creek that are engaged in the repair of all types of vessels from many ports, including the latest type of ocean-going tankers and cargo vessels. The waterway is within the free lighterage limits of the Port of New York. Freight delivered by rail in carload lots and consigned to any terminal in this area is lightered free of charge from the water-front terminals of the railroads serving the port.

14. The total population of the Boroughs of Brooklyn, Queens, Manhattan, and Bronx of the city of New York, tributary in part to Gowanus Creek Channel, as given in the 1940 cenus was 7,280,554. The estimated population of these boroughs for 1949 as obtained from the department of health, city of New York, is 7,965,000, showing an increase 8.6 percent over the 1940 population.

15. The area in the vicinity of Gowanus Creek Channel is well served by transportation facilities. Commodities are distributed locally by truck, from the water terminals, over a network of highways and bridges to points in New York City and Long Island. A considerable amount of intraport commerce moves in railroad-owned lighters. The nearest railroad station is that of the Long Island Railroad, 2.5 miles from Gowanus Creek Channel.

16. *Bridges, pipelines, and cables.*—No bridges, pipelines, or overhead cables cross the section of the waterway under consideration. Ten submarine cables, owned by the New York Telephone Co., cross the existing 18-foot project channel at the foot of Creamer Street in a trench having a depth of 25 feet below mean low water. These cables were placed under plans approved by the Department of the Army. In addition, 18 submarine cables, owned by the Brooklyn Edison Co., cross the waterway near the Hamilton Avenue Bridge above the upper limit of the existing Federal project, at depths ranging from 14 to 22 feet below mean low water. The proposed improvement will not require lowering of the afore-mentioned submarine cables.

17. *Prior reports.*—All prior reports on Gowanus Creek Channel, with the exception of the preliminary report described in paragraph 3, are listed and described in table 1, reports under review.

18. *Existing Corps of Engineers' project.*—The first project for improvement of Gowanus Creek was adopted by the River and Harbor Act of March 3, 1881, under a general project for Gowanus Bay, N. Y. (H. Ex. Doc. No. 48, 46th Cong., 3d sess.). This project provided for a channel extending from Gowanus Bay to the Hamilton Avenue drawbridge, with a depth of 18 feet at mean low water and a width of 200 feet, except for the upper few hundred feet where the width was to be gradually reduced to 100 feet. This project was modified by the River and Harbor Act of August 11, 1888, which provided for deepening to 21 feet at mean low water and widening of the channel to 400 feet on the northerly side, from the foot of Percival Street to opposite Erie Basin. The portion of the project above Percival Street has never been modified and still forms a part of the existing project. (See par. 19.) The River and Harbor Act of September 19, 1890, provided for inclusion of the portion of the project below Twenty-eighth Street in Bay Ridge Channel in Gowanus Bay, which is now part of the project for Bay Ridge and Red Hook Channels, N. Y. The portion of the project above Twenty-eighth Street was designated as Gowanus Creek Channel. The amount expended on Gowanus Creek Channel under the foregoing previous projects is estimated at $75,000 for new work and maintenance.

19. The existing project for Gowanus Creek Channel was adopted by the River and Harbor Acts of March 3, 1881, and June 3, 1896. It provides for a channel 26 feet deep at mean low water from Bay Ridge Channel at Twenty-eighth Street to the foot of Percival Street with width decreasing from 300 feet at Twenty-eighth Street to 200 feet at Percival Street, and thence 18 feet deep at mean low water to the Hamilton Avenue Bridge, gradually decreasing in width to 100 feet at the bridge. The work under this project was completed in 1904.

20. The total cost of the existing project to June 30, 1949, was $140,121.88, of which $70,000 was for new work and $70,121.88 for maintenance. The latest maintenance dredging was completed in January 1940, involving removal of 63,801 cubic yards of material at a cost of $27,073.36. Since completion of the project in 1904, maintenance has been performed at an average interval of once every 12 years. The latest (1928) approved estimate for annual cost of maintenance is $6,000 which is considered adequate.

21. *Local cooperation on existing and prior projects.*—There are no prescribed conditions of local cooperation under the existing project.

22. *Other improvements.*—Since 1944 local interests have expended approximately a total of $6,000,000 in the development of water-front terminals and berthing facilities in the section of Gowanus Creek under consideration. In this period approximately 270,000 cubic yards of material have been removed by local interests in maintenance dredging of berthing areas at the various terminals, to depths up to 38 feet below mean low water, to provide safe berthage for deep-draft vessels. The Port of New York Authority has completely rehabilitated and modernized its grain terminal including the Columbia Street pier and the grain elevator, and constructed a new grain pier and gallery for loading grain direct from the elevator to deep-draft

vessels, at a total cost of over $1,000,000. The gallery is the only facility of its kind in New York Harbor.

23. In addition to the afore-mentioned improvements, local interests have signified their intentions of undertaking further developments. The Brooklyn Pier, Inc., owned and operated by the Brooklyn Waterfront Terminal Corp., is planning to construct a huge terminal for ocean-going vessels on the property vacated by the Sullivan Drydock & Repair Corp. The work would include the removal of several old piers, the construction of new and modern piers and bulkheads, with transit houses, and the development of the upland for industrial sites, at an estimated total cost of $9,000,000. The Brooklyn Waterfront Terminal Corp. also plans to expend an additional $3,000,000 on its existing terminals. This company stated that all this work is dependent on provision of a project depth of 30 feet. The Prospect Terminal Corp. anticipates the expenditure of about $1,250,000 for a proposed new warehouse, pier, and bulkhead. The Patchogue Oil Terminal Corp. plans to install an additional 600,000-gallon storage tank at a cost of $600,000. The Port of New York Authority is planning the extension of its property to include the area immediately adjacent to the head of Henry Street Basin.

24. *Terminal and transfer facilities.*—Gowanus Creek Channel is well equipped with terminal facilities; all of the water front is fully developed. The entire waterway, including Henry Street Basin, has 27 piers and 28 bulkhead terminals, with depths of water varying from 1 to 45 feet at mean low water. The total available berthage is about 37,500 feet. The total assessed value of land and improvements devoted to terminal and transfer facilities is over $19,000,000. All of the terminals are accessible by city streets, but none has direct rail connection. A detailed description of the terminals along the 26-foot and 18-foot project channels and along Henry Street Basin, including handling and storage facilities, is contained in appendix D [1] herewith.

25. Although there is little vacant space available for additional terminal development on the waterway, several local interests are planning improvement and modernization of existing terminal facilities and provision of additional storage space. (See par. 23.)

26. *Improvement desired.*—A public hearing to obtain information for use in preparation of the preliminary report was held by the district engineer, New York district, in New York city on June 6, 1946. The hearing was attended by representatives of the United States Geological Survey, the Port of New York Authority, the department of public works, State of New York, the New York State Water Power and Control Commission, the departments of public works, marine and aviation, and city planning of the city of New York, the office of the borough president of Brooklyn, and a number of commercial interests. A digest of the hearing is contained in appendix C [1] herewith.

27. A statement of the improvements desired was submitted at the public hearing by the Port of New York Authority. It included, in addition to the desires of this agency, the requests of various commercial interests along Gowanus Creek Channel. The specific inprovements requested were the deepening of the existing 26-foot and 18-foot project channels in Gowanus Creek to 30 feet, and dredging of a branch channel in Henry Street Basin, 30 feet deep and 100 feet wide for a

[1] Not printed.

distance of 1,000 feet, thence 15 feet deep and 100 feet wide to the head of the basin. The Prospect Terminal Corp. expressed the desire to have the entire 26-foot project channel deepened to 30 or 32 feet and the 18-foot project channel deepened to 26 or 28 feet for a distance of 400 to 500 feet.

28. The requests for improving the 18-foot project channel were modified prior to submission of the preliminary report, to exclude the deepening of the channel above a line extending from the upper end of Colonial Sand & Stone Corp. bulkhead on the west side of the channel to the upper end of the Prospect Terminal Corp. bulkhead on the east side, as shown on accompanying map, figure 2. This modification was agreed upon by all of the local interests concerned in the improvement of the waterway, when it became apparent that the bulkheads above this line could not stand additional depth of water and that their owners either did not require a deeper channel or did not desire it in view of the fact that the cost of reconstruction of the bulkheads would exceed any benefits that might result from the improvement.

29. In justification of the proposed improvements, the Port of New York Authority cited annual benefits to commerce and navigation estimated at $525,000, consisting of $100,000 from the elimination of delays in waiting for tides, $50,000 from elimination of additional costs in the shipment of grain resulting from moving of partially loaded deep-draft vessels to other terminals to permit loading to capacity, and $375,000 from elimination of lighterage costs on general cargo received along the present 18-foot channel.

30. It was pointed out that six of the terminals along the waterway accommodate ocean-going vessels, many of which draw over 26 feet and must navigate on the tide. It was estimated that approximately 491 deep-draft vessels would annually utilize Gowanus Creek Channel, if the channel were deepened to 30 feet. It was brought out that the ships using this channel include, among others, the following types which draw in excess of 26 feet: Liberty, Victory, C–2, C–3, C–4, and T–2 tankers. These ships can operate now only during high-tide periods and are therefore subject to delay.

31. It was also pointed out that four of the terminals along the 18-foot channel are presently limited to barge navigation, but with a deeper channel substantial reductions in transportation cost could be achieved by the use of deep-draft vessels. It was also stated that in addition to the transportation benefits the improvement of the channel would eliminate hazards of grounding which occur from time to time; would make available for deep-draft ships, 17 additional commercial cargo berths, thereby aiding in easing the pressure on pier space in New York Harbor; and would accelerate the expansion and modernization of water-front terminals along Gowanus Creek Channel.

32. The adoption of a project in Henry Street Basin was requested by the Port of New York Authority and Ira S. Bushey & Sons, Inc., on the contention that the improvement of this waterway is a Federal responsibility and that it would result in considerable economic benefits. The Port of New York Authority has constructed a new grain pier and gallery along Henry Street Basin to enable ships to be loaded directly from the grain gallery. These ships, when fully loaded, draw 28 to 29 feet. The authority therefore considers it necessary that channels leading to the grain pier be dredged to 30 feet to permit safe passage of these vessels, fully loaded.

33. The Prospect Terminal Corp. requested the deepening of a portion of the 18-foot project channel to 26 or 28 feet to facilitate the maneuvering of vessels in and out of its terminal at the upper end of the 26-foot project channel. This company stated that on many occasions because of the congestion in the waterway, it was necessary for large ships to utilize the lower portion of the 18-foot channel. In the past this could be accomplished only when the vessels were light. However, this company stated that the deeper channel is required when this maneuver is necessary with loaded deep-draft vessels.

34. Investigation made subsequent to authorization of the survey revealed no change in the desires of local interests with respect to the originally proposed improvements of Gowanus Creek Channel and Henry Street Basin.

35. In the matter of local cooperation, no offer of cash contribution toward the cost of the proposed improvements has been made. It was stated by several commercial interests that they would dredge their slips and strengthen their bulkheads, if required because of the greater depth in the channel. As there are no areas along the waterway available for disposal of dredged material, no offer of spoil-disposal areas has been made.

36. *Commerce.*—The water-borne commerce of Gowanus Creek and Canal for the 20-year period after the completion of the existing project in the section of the waterway downstream from Hamilton Avenue, in 1904, averaged 2,800,000 tons. It decreased during World War I and reached a minimum of 1,550,000 tons in 1920, then rose rapidly to over 3,000,000 tons in 1923. Of this commerce between 2,000,000 and 2,500,000 tons were generally attributed to Gowanus Canal and about 700,000 tons to Gowanus Creek Channel. The latter consisted mainly of domestic commerce including coal, ice, lumber, and building materials. In addition, a considerable business in repair of steamships and small vessels and in harboring yachts over the winter existed along Gowanus Creek Channel.

37. A comparative statement of the total reported water-borne commerce of Gowanus Creek and Canal for the 25-year period to 1947 is shown in table A2, appendix A.[1] During this period the commerce averaged 4,000,000 tons, with a minimum of about 3,000,000 tons in 1923 and a maximum of about 5,000,000 tons in 1930, excluding tonnages of the section below Twenty-eighth Street. The increase in commerce during the latter period was due to a general increase in foreign and domestic commerce. During the period 1924 to 1941, it is estimated that 2,500,000 tons were transported to and from Gowanus Canal and 1,500,000 tons were handled in the section under consideration below Hamilton Avenue. During the years immediately preceding World War II, the latter commerce consisted mainly of petroleum products, coal, grain, ores, sugar, cocoa beans, and general cargo. Additional car ferry traffic for the period 1924 to 1947 averaged 97,400 tons and amounted to 127,330 tons in 1947. This commerce was handled in the 26-foot project channel section.

38. During World War II the reported commerce decreased from about 4,500,000 tons in 1941 to 2,500,000 tons in 1945. This decrease is attributed to the fact that many of the piers that were normally used for receipt and shipment of cargo were diverted to ship-repair

[1] Not printed.

work or taken over for the storage of ships and for Coast Guard and Navy operations, and to the practice of not reporting cargoes carried in vessels operated by the United States Army or Navy. Subsequent to the war these piers were returned to normal use. The reported commerce for 1947 of 3,600,000 tons and the commerce for 1948 of 4,100,000 tons as obtained from the draft of part 2 of the 1949 Annual Report of the Chief of Engineers, supplemented by a field investigation, indicate a return to the prewar average of about 4,000,000 tons. During these years about 60 percent of the total commerce (2,300,000 tons) was handled in the section of the waterway under consideration below Hamilton Avenue. Further details on this commerce are contained in appendix A[1] herewith.

39. A breakdown of the 1948 commerce for the sections of the waterway under consideration, showing commodities carried in deep draft and shallow-draft vessels, is contained in table 2. About 1,200,00 tons or 52 percent of the total commerce were carried in deep-draft vessels as compared to the prewar average of 650,000 tons. (See par. A3, appendix A[1].) Of the total deep-draft commerce in 1948, about 1,100,000 tons of general cargo, petroleum products and ores were handled by seven companies located on the 26-foot project channel; 40,000 tons of general cargo were handled at the Seaboard Storage Terminal Corp., located at the junction of the 26-foot and 18-foot project channels; and 68,000 tons of grain and about 12,000 tons of sugar were handled at the Port of New York Authority pier on Henry Street Basin. In addition, the Bethlehem Steel Co., shipbuilding division, and Ira S. Bushey & Sons, Inc., located along the 26-foot project channel, repaired a total of 917 vessels consisting of 240 cargo ships, 29 tankers, and 648 harbor craft and oceangoing tugs.

40. The extent and importance of the deep-draft commerce on Gowanus Creek Channel is evidenced by the fact that during the prewar year 1940, this waterway ranked seventh in foreign imports and exports and tenth in coastwise receipts out of 43 federally improved waterways within the port of New York. It has retained the same rank since termination of the war. A comparison of the 1947 total reported commerce of Gowanus Creek Channel, up to the upper limit of the existing project at Hamilton Avenue, with the commerce of the nearby 40-foot projects of Bay Ridge and Red Hook Channels and Buttermilk Channel follows: Gowanus Creek Channel, 2,300,000 tons; Bay Ridge and Red Hook Channels, 6,400,000 tons; Buttermilk Channel, 4,000,000 tons. These comprise all of the federally improved channels with depths greater than 25 feet along the Brooklyn and Queens water front, with the exception of East River.

41. *Prospective commerce.*—In order to estimate the prospective commerce in Gowanus Creek Channel, a study was made of the trend of deep-draft commerce for the 25-year period 1923 to 1947. (See tables A2 and A4 of appendix A.[1]) Immediate and long-range estimates of the prospective deep-draft commerce were obtained from the various interests involved. These estimates were analyzed in the light of past trends and the present storage capacities of concerns located along the waterway. The results of this study for the various commodities considered are described in the following paragraphs. Further details are contained in appendix A.[1]

[1] Not printed.

TABLE 2.—*1948 water-borne commerce in tons carried in deep-draft and shallow-draft vessels, Gowanus Creek Channel*

Commodity	26-foot channel			18-foot channel [1]		
	Receipts	Shipments	Total	Receipts [2]	Shipments	Total
General cargo:						
Deep draft	365,000	306,400	671,400			
Shallow draft	72,700	176,100	248,800	61,400	59,100	120,500
Total	437,700	482,500	920,200	61,400	59,100	120,500
Petroleum products:						
Deep draft	405,500	48,900	454,400			
Shallow draft	180,400	155,000	335,400	40,900		40,900
Total	585,900	203,900	789,800	40,900		40,900
Coal: Shallow draft	125,000		125,000	24,000		24,000
Grain:						
Deep draft						
Shallow draft						
Total						
Building materials: Shallow draft				54,800		54,800
Ores (Chilean nitrate):						
Deep draft	21,900		21,900			
Shallow draft						
Total	21,900		21,900			
Total deep draft	792,400	355,300	1,147,700			
Total shallow draft	378,100	331,100	709,200	181,100	59,100	240,200
Grand total	1,170,500	686,400	1,856,900	181,100	59,100	240,200

Commodity	Henry Street Basin			Total all sections under consideration		
	Receipts	Shipments	Total	Receipts	Shipments	Total
General cargo:						
Deep draft	11,700		11,700	376,700	306,400	683,100
Shallow draft	9,100	5,400	14,500	143,200	240,600	383,800
Total	20,800	5,400	26,200	519,900	547,000	1,066,900
Petroleum products:						
Deep draft				405,500	48,900	454,400
Shallow draft	57,100		57,100	278,400	155,000	433,400
Total	57,100		57,100	683,900	203,900	887,800
Coal: Shallow draft				149,000		149,000
Grain:						
Deep draft		68,000	68,000		68,000	68,000
Shallow draft	49,000		49,000	49,000		49,000
Total	49,000	68,000	117,000	49,000	68,000	117,000
Building materials: Shallow draft				54,800		54,800
Ores (Chilean nitrate):						
Deep draft				21,900		21,900
Shallow draft						
Total				21,900		21,900
Total deep draft	11,700	68,000	79,700	804,100	423,300	1,227,400
Total shallow draft	115,200	5,400	120,600	674,400	395,600	1,070,000
Grand total	126,900	73,400	200,300	1,478,500	818,900	2,297,400

[1] In addition to the above commerce 99,320 tons of rubbish was shipped by barge to sea or elsewhere from the 18-foot channel section.

[2] Commerce carried in deep-draft vessels to the Seaboard Storage Corp. terminal at junction of 26-foot and 18-foot project channels included under 26-foot project channel.

42. The trend of commerce carried in deep-draft vessels in Gowanus Creek Channel is increasing. The average deep-draft commerce prior to World War II totaled 670,000 tons. In 1948 this commerce had increased to 1,227,400 tons, consisting of 705,000 tons of general cargo and ores, 454,000 tons of petroleum products and 68,000 tons of grain, comprising 57, 37, and 6 percent, respectively, of the total deep-draft commerce. Approximately 94 percent of this commerce was handled along the 26-foot project channel, including the deep-draft commerce handled by the Seaboard Storage Corp. at the junction of the 26-foot and 18-foot project channels, and the remaining 6 percent was handled along Henry Street Basin.

43. With reference to prospective commerce, the Patchogue Oil Terminal Corp., which handles all the petroleum commerce in bulk quantities, submitted estimates of 2,950,000 tons for the year 1952 and 4,067,000 tons for 1975. The estimates are indicative of an immediate substantial increase and a steady continuous rise over the 1948 petroleum commerce of 1,361,200 tons. Based on a study of past trends of petroleum commerce on other waterways in New York Harbor and along the North Atlantic Coast, these estimates appear high. Although it is safe to assume that future commerce in petroleum products would be greater than present commerce because of population growth in the tributary area and the increased utilization of this commodity in industry, home heating and motor transportation, the average petroleum commerce that would prevail during the life of the improvement cannot be readily evaluated. In view of this and the fact that the improvement can be justified on the basis of existing commerce, no attempt has been made to estimate the prospective petroleum commerce. The total deep-draft prospective annual commerce in general cargo and ores is estimated to be about the same as in 1948, or 705,000. This is based on the prewar average deep-draft commerce of 450,000 tons, the generally rising trend in this commerce, and the expected expansion and modernization of the terminals on the waterway. (See par. 23.) The prospective commerce in grain to be carried in deep-draft vessels from Henry Street Basin is estimated by the Port of New York Authority at 200,000 tons, or the same as the average for the years prior to World War II. The decrease in grain commerce in recent years has been attributed to adverse freight rate differentials resulting in the diversion of the grain-export trade to other Atlantic ports. A request has recently been made by the Port of New York Authority for equalization of the freight rates, and on the assumption of a favorable decision it is anticipated that this trade will return to prewar levels. However, for purposes of conservative evaluation of benefits only the 68,000 tons of grain commerce of the Port of New York Authority handled in 1948 will be accepted as the average commerce that would prevail during the life of the improvement. In addition, a lumber concern which has recently located on Henry Street Basin expects to receive about 90,000 tons (5,500,000 board feet) of lumber annually. This lumber is received from the west coast in deep-draft vessels and is distributed by lighter or barge.

44. A summary of the past and present deep-draft commerce for the foregoing commodities is shown in table 3. Although prospective commerce would probably be greater than the present commerce, as discussed in the preceding paragraphs, the latter will be used in arriving at a conservative estimate of benefits.

TABLE 3.—*Summary of past and present deep-draft commerce*

Commodity	Annual average before World War II	Existing commerce
	Tons	*Tons*
Petroleum products	[1] 20,000	454,000
General cargo and ores	450,000	705,000
Grain	200,000	68,000
Lumber		[2] 90,000
Total deep-draft commerce	670,000	1,317,000

[1] Regular deep-draft commerce commenced in 1946.
[2] Estimate of existing annual commerce in lumber based upon receipts in 1949. (See par. A22, appendix A.)

45. *Vessel traffic.*—A comparative list of the trips and drafts of vessels, excluding local traffic, using Gowanus Creek and Canal during the years 1922 to 1947 is shown in table A3, appendix A.[1] In general there has been an increase in the number of deeper-draft vessels using Gowanus Creek Channel. In the 20-year period preceding World War II, between 1922 and 1941, a total of 310 trips were made in this channel by vessels drawing 26 feet or more, including 66 trips with drafts between 28 and 30 feet and 6 trips with drafts between 30 and 32 feet. The annual number of trips made by deep-draft vessels exceeding 26 feet varied from 1 to 42 with an average of about 16. The statistics for the war years 1942 to 1945 include traffic in Gowanus Bay below Twenty-eighth Street and are also incomplete with respect to the Gowanus Creek Channel traffic to permit comparison with the prewar traffic. A number of the terminals were taken over by the Navy and Coast Guard whose vessel movements were not reported. During the postwar years 1946 and 1947 a total of 208 trips were made in Gowanus Creek Channel by vessels drawing 26 feet or more, including 36 trips with drafts between 28 and 30 feet and 29 trips with drafts between 30 and 32 feet. This total for the 2-year period amounted to 67 percent of the total similar traffic for the entire 20-year period between 1922 and 1941.

46. The increase in the number of vessels drawing more than 26 feet in recent years is a result of the construction during World War II of larger and more efficient dry cargo ships and tankers. The types and dimensions of the newer-type vessels presently utilizing Gowanus Creek Channel are given in table 4.

TABLE 4.—*Deep-draft vessels presently using Gowanus Creek Channel*

Class of ship	Over-all length	Beam	Draft loaded	Deadweight tonnage
Cargo ships:	*Feet*	*Feet*	*Feet*	
Miscellaneous	320–410	50–60.0	23.5–25.5	6,000–8,000
C–2	459	63.0	25.9	8,981
C–3	492	69.5	28.6	12,929
C–4	522	71.5	32.8	14,600
War emergency ships:				
Liberty [1]	441	56.9	27.8	10,800
Victory	455	62.0	28.6	10,850
Tankers: T–2	523	68.0	30.2	16,765

[1] Cargo ship or tanker.

[1] Not printed.

47. A separation of the trips and drafts of vessels in the 26-foot and 18-foot project channels and in Henry Street Basin for 1947, the latest year of published record, is shown in table 5. The number of the in-bound and out-bound trips in the 26-foot project channel, the 18-foot project channel and in Henry Street Basin were 19,536, 1,334, and 292, respectively, or a total of 21,162 trips. Of this total number of trips, about 92.1 percent were with drafts less than 12 feet, 7.6 percent with drafts ranging from 12 to 26 feet, and 0.3 percent with drafts exceeding 26 feet. The total number of trips of vessels with drafts exceeding 26 feet was 61.

48. *Difficulties attending navigation.*—The major difficulty attending navigation in Gowanus Creek Channel is that of insufficient depth in the 26-foot section which precludes efficient operation of the larger and more economical deep-draft vessels now in use. Another difficulty arises from congestion especially at the upper end of the 26-foot project, which together with the limited channel width and the shallower depths in the adjoining 18-foot section, causes considerable delays in maneuvering deep-draft vessels in and out of the berths of the Prospect Terminal Corp. The congested condition of the entire waterway is particularly aggravated during the hours of high tide with the concentration of deep-draft vessels on the waterway taking advantage of the additional depth of water. On many occasions over 50 barges and other vessels have moored in the vicinity of the junction of Gowanus Creek Channel and Henry Street Basin, thus obstructing berthing operations. In some instances moored vessels in Gowanus Creek have extended into the project channel and hindered navigation of other vessels. Due to the foregoing conditions deep-draft navigation on this waterway is confined to daylight hours.

49. In addition to the foregoing difficulties, the depths of water in Henry Street Basin are insufficient to accommodate the cargo ships that are berthed at the Port of New York Authority new grain pier or the deep-draft cargo ships and tankers that Ira S. Bushey & Sons, Inc., desires to berth at its terminal along Henry Street Basin. Deep-draft cargo vessels are presently able to navigate with some difficulty a narrow fairway from Gowanus Creek Channel to the grain pier as a result of dredging by the Port Authority in 1945. The survey of Henry Street Basin made by this office in March 1949 indicates that the depths in the lower thousand feet of the basin range from 29 to 30 feet at mean low water on the west side and from 19 to 23 feet on the east side, with a controlling depth of 21 feet for a 150-foot width. Navigation difficulties due to congestion on this basin are similar to those on Gowanus Creek Channel. A channel 30 feet deep and 150 feet wide is required in the lower section of the basin to provide proper access to the berthing areas.

50. Depths in the lower portion of the 18-foot project are insufficient to provide proper access to the Seaboard Storage Corp. wharf. This company has dredged a narrow approach to its wharf to a depth of 25 feet to permit berthing of deep-draft vessels. At present berthing is accomplished only with considerable difficulty by proceeding along a very limited area outside the channel lines. Provision of a greater depth in the lower portion of the 18-foot project channel would eliminate this difficulty.

51. Insufficient depths have resulted in accidents due to grounding. Two such accidents are known to have occurred during the last few

Draft	In-bound						Out-bound					
	Steamers	Motor vessels	Sailing	Barges	Car ferry	Total	Steamers	Motor vessels	Sailing	Barges	Car ferry	Total
26-FOOT PROJECT CHANNEL [1]												
30 feet	8					8	2					2
28 to 30 feet	9	3				12						
26 to 28 feet	12	2				14	16					16
24 to 26 feet	8	2				10	17	4				21
22 to 24 feet	20	3				23	22	3				25
20 to 22 feet	68	27				95	55	28		2		85
18 to 20 feet	2		1	2		5	7	2				9
16 to 18 feet	422			21		443						
14 to 16 feet	1	1	5	186		193						
12 to 14 feet	181	20	2	290		493				9		9
Less than 12 feet	90	237	5	7,566	574	8,472	702	258	13	8,054	574	9,601
Total trips	821	295	13	8,065	574	9,768	821	295	13	8,065	574	9,768
Total net registered tonnage	860,359	145,201	13,700	3,227,661	416,568	4,663,489	860,359	145,201	13,700	3,227,661	416,568	4,663,489
18-FOOT PROJECT CHANNEL [1]												
14 to 16 feet				117		117						
12 to 14 feet				41		41						
Less than 12 feet	16	97		396		509	16	97		[2] 554		667
Total trips	16	97		554		667	16	97		554		667
Total net registered tonnage	3,334	2,963		202,420		208,717	3,334	2,963		202,420		208,717
HENRY STREET BASIN												
28 to 30 feet							9					9
20 to 22 feet	9					9						
18 to 20 feet												
16 to 18 feet												
14 to 16 feet				1		1						
12 to 14 feet				31		31						
Less than 12 feet		7		98		105		7		130		137
Total trips	9	7		130		146	9	7		130		146
Total net registered tonnage	65,538	632		67,126		133,296	65,538	632		67,126		133,296

[1] Deep-draft vessel traffic to and from the Seaboard Storage Corp. terminal at junction of 26-foot and 18-foot project channels included under 26-foot project channel.
[2] Includes vessel traffic connected with the disposal of 100,140 tons of rubbish at sea or elsewhere.

TABLE 5.—*Trips and drafts of vessels in Gowanus Creek Channel, 1947*—Continued

Draft	In-bound						Out-bound					
	Steamers	Motor vessels	Sailing	Barges	Car ferry	Total	Steamers	Motor vessels	Sailing	Barges	Car ferry	Total
TOTAL FOR GOWANUS CREEK CHANNEL												
30 feet	8					8	2					2
28 to 30 feet	9	3				12	9					9
26 to 28 feet	12	2				14	16					16
24 to 26 feet	8	2				10	17	4				21
22 to 24 feet	20	3				23	22	3				25
20 to 22 feet	77	27				104	55	28		2		85
18 to 20 feet	2		1	2		5	7	2				9
16 to 18 feet	422			21		443						
14 to 16 feet	1	1	5	304		311						
12 to 14 feet	181	20	2	362		565				9		9
Less than 12 feet	106	341	5	8,060	574	9,086	718	362	13	8,738	574	10,405
Total trips	846	399	13	8,749	574	10,581	846	399	13	8,749	574	10,581
Total net registered tonnage	929,231	148,796	13,700	3,497,207	416,568	5,005,502	929,231	148,796	13,700	3,497,207	416,568	5,005,502

years. The *Sea Marlin*, a C–3-type vessel, was grounded for 3 hours on a 22-foot shoal in Henry Street Basin, after leaving the grain terminal. A cargo vessel loaded to a draft of 25 feet also grounded on a shoal area in the 26-foot project channel. In addition, eight vessels consisting of barges and tugs, were reported sunk in Gowanus Creek Channel and Henry Street Basin since 1943. The causes of the accidents are not known, but one barge tied alongside a wharf sustained damages as a result of swells and suction created by a passing vessel.

52. *Water power and other special subjects.*—No opportunity for the development of water power exists. The question of flood control is not pertinent. The proposed improvement would not affect any coordinated plan for water supply, irrigation, abatement of pollution, land reclamation, or other collateral purposes. The proposed improvements have no fish or wildlife aspects to be considered.

53. *Plans of improvement.*—Two plans of improvement, generally in accordance with the desires of local interests, are presented herein and are shown on accompanying map, figure 2. Both plans of improvement are similar in that each provides for deepening the existing 26-foot project and the lower portion of the 18-foot project of Gowanus Creek Channel, including widening of the channel at the lower end of the project, and for a branch channel in the lower portion of Henry Street Basin. They differ only with respect to channel depth.

54. Description of the plans of improvement follow:

(*a*) Plan 1 (recommended improvement): This plan, which is the most economic, provides for deepening the existing 26-foot project of Gowanus Creek Channel to 30 feet at mean low water, including extension of the deepened channel about 500 feet into the 18-foot project and widening of the channel at the junction with the existing 40-foot project of Bay Ridge and Red Hook Channels, and for a branch channel 30 feet deep and 150 feet wide in the lower 1,000 feet of Henry Street Basin. The extension of the deep channel into the 18-foot project section is required for safe maneuvering of vessels to and from the terminals at the upper end of the 26-foot project and for the accommodation of the deep-draft vessels using the terminal on the west side of the lower end of the 18-foot project. The tapering of the extended deep channel away from the existing east channel line has been provided for the purpose of avoiding bulkhead reconstruction which would otherwise be required. The widening of the channel at the lower end of the existing 26-foot project would serve as a gradual transition with the existing 40-foot project of Bay Ridge and Red Hook Channels and would also ease the approach to Henry Street Basin. The recommended channel depth under this plan, although not quite sufficient for the accommodation of all vessel traffic at all stages of the tide, was determined to be adequate and the most practicable at the present time. Under this plan, more than half of all the deep-draft vessels could utilize the channel at all stages of the tide and the remaining would encounter an average delay of only 1 hour in waiting for suitable tidal heights. The recommended channel width of 150 feet for Henry Street Basin is the minimum that is considered necessary for channel purposes and the maximum that can be provided without encroaching upon the adjacent berthing areas. This channel would provide an adequate approach to these berthing areas.

(*b*) Plan 2: This plan provides for deepening the existing 26-foot project of Gowanus Creek Channel to 32 feet, including extension of the deepened channel about 500 feet into the 18-foot project and widening of the channel at the junction with the existing 40-foot project of Bay Ridge and Red Hook Channels, and for a branch channel 32 feet deep and 150 feet wide in the lower 1,000 feet of Henry Street Basin.

55. *Aids to navigation.*—The Third District of the United States Coast Guard was consulted in connection with any possible aids to navigation that might be required under the foregoing plans of improvement. It was disclosed that no aids to navigation would be required.

56. *Shore-line changes.*—The proposed improvement would not affect the existing shore lines.

57. *Estimates of first cost.*—The estimates of first cost of the plans considered in paragraph 54 are shown in table 6. As there are no suitable disposal areas in the vicinity of the proposed work, it was assumed that the material to be dredged, which consists of mud, sand, and clay would be removed by dipper dredge and disposed of at sea. An overdepth of 2 feet and side slopes of 1 on 3 are included in the estimates. A discussion of the estimates is contained in appendix B [1] herewith.

TABLE 6.—*Estimates of first cost*

Plan	Item	Quantity (cubic yards)	Unit cost	Total cost [1]
1	(*a*) Deepening existing 26-foot project channel to 30 feet and extension of deepened channel about 500 feet upstream into 18-foot project [2]	205,000	$0.85	$227,000
	(*b*) Provision of a channel 30 feet deep and 150 feet wide in lower 1,000 feet of Henry Street Basin	54,000	.85	60,000
	Total plan 1	259,000	.85	287,000
2	(*c*) Deepening existing 26-foot project channel to 32 feet and extension of deepened channel about 500 feet upstream into 18-foot project [2]	284,000	.85	310,000
	(*d*) Provision of a channel 32 feet deep and 150 feet wide in lower 1,000 feet of Henry Street Basin	71,000	.85	78,000
	Total plan 2	355,000	.85	388,000

[1] Includes contingencies, engineering, supervision, and overhead.
[2] Includes widening of channel at lower end of 26-foot project.

58. In connection with the plans of improvement, it would be necessary to deepen the approaches and berthing areas at the wharves of Ira S. Bushey & Sons, Inc., Marra Bros., Inc., Seaboard Storage Corp., Colonial Sand & Stone Corp., Prospect Terminal Corp., and Brooklyn Waterfront Terminal Corp. along Gowanus Creek Channel and at the wharves of the Port of New York Authority and Ira S. Bushey & Sons, Inc., along Henry Street Basin. The cost of dredging these areas to depths corresponding to the channel depth provided for under plan 1, is estimated at $116,000 for the wharves along Gowanus Creek Channel and $25,000 for the wharves along Henry Street Basin. The corresponding costs under plan 2 are estimated at $166,000 and $40,000 for Gowanus Creek Channel and Henry Street Basin, respectively. With the greater depth provided for under plan 2 there is a possibility that some of the wharves might require strengthening or reconstruction under this plan. As no details

[1] Not printed.

are available as to the condition of these wharves no attempt has been made to estimate the cost of such additional work that might be required. No costs for lands would be involved in connection with the proposed plans of improvement.

59. *Estimates of annual charges.*—The determination of the Federal and non-Federal annual charges for the foregoing plans of improvement is given in table 7. No allowance has been made for interest during construction since the time required for the work would normally be less than 1 year. As indicated in the preceding paragraph some wharf reconstruction might be required in connection with plan 2, but its extent is not known. Therefore, this work has not been included in the economic analysis.

TABLE 7.—*Estimates of annual charges*

Item	Plan 1 (recommended improvement)	Plan 2
A. Federal investment:		
(1) Estimated expenditure (first cost) by the Corps of Engineers for new work	$287,000	$388,000
(*a*) Gowanus Creek Channel	227,000	310,000
(*b*) Henry Street Basin	60,000	78,000
B. Federal annual charges:		
(1) Interest (3 percent)	8,610	11,640
(*a*) Gowanus Creek Channel	6,810	9,300
(*b*) Henry Street Basin	1,800	2,340
(2) Amortization (50-year life at 3 percent)	2,540	3,440
(*a*) Gowanus Creek Channel	2,010	2,750
(*b*) Henry Street Basin	530	690
(3) Additional cost of maintenance [1]	1,500	1,500
(*a*) Gowanus Creek Channel		
(*b*) Henry Street Basin	1,500	1,500
(4) Total Federal annual charges	12,650	16,580
(*a*) Gowanus Creek Channel	8,820	12,050
(*b*) Henry Street Basin	3,830	4,530
C. Non-Federal investment:		
(1) Deepening of approaches and berths	141,000	206,000
(*a*) Gowanus Creek Channel	116,000	166,000
(*b*) Henry Street Basin	25,000	40,000
D. Non-Federal annual charges: [2]		
(1) Interest (3½ percent)	4,940	7,210
(*a*) Gowanus Creek Channel	4,060	5,810
(*b*) Henry Street Basin	880	1,400
(2) Amortization (50-year life at 3½ percent)	1,080	1,570
(*a*) Gowanus Creek Channel	890	1,270
(*b*) Henry Street Basin	190	300
(3) Total non-Federal annual charges	6,020	8,780
(*a*) Gowanus Creek Channel	4,950	7,080
(*b*) Henry Street Basin	1,070	1,700
E. Total annual charges:		
(1) Total, item b (4) plus item d (3)	18,670	25,360
(*a*) Gowanus Creek Channel	13,770	19,130
(*b*) Henry Street Basin	4,900	6,230

[1] Based upon an average shoaling of 0.2 foot per year in Henry Street Basin. With respect to Gowanus Creek Channel it is considered that maintenance would be the same as that required under the existing project.

[2] No maintenance charges are included as it is considered that the cost of maintaining the approaches and berths would be the same as at present.

60. *Estimates of benefits.*—The deepening of Gowanus Creek Channel, together with the provision of a branch channel in Henry Street Basin, to 30 or 32 feet (plans 1 and 2) would result in savings primarily from elimination of delays in waiting for suitable tidal heights. Some benefits would also accrue from the reduction of vessel accidents due to grounding. Delays due to waiting for suitable tidal heights prior to entering the 26-foot and 18-foot project channels are presently encountered by Liberty, Victory, C–2, C–3, and C–4 type cargo vessels and T–2 tankers. Similar delays are encountered by cargo ships in entering or leaving Henry Street Basin. It is estimated that the proposed improvements under plans 1 and 2, would result in an average saving of 3.5 hours per vessel trip for cargo ships from elimination of delays in waiting for suitable tidal heights. With respect to tanker traffic, an average saving of 5 and 6 hours per vessel trip would result from reduction of similar delays under plans 1 and 2, respectively. The total annual savings from elimination of delays are estimated at $42,500 and $45,000 under plans 1 and 2, respectively, on the basis of existing deep-draft commerce, and operation costs of $100 per hour for T–2 tankers and $85 per hour for cargo vessels. (See tables 3 and 8.) On the basis of anticipated greater average commerce during the life of the improvement the benefits would be greater. Further details on the prospective benefits are given in appendix A.[1]

TABLE 8.—*Summary of annual transportation savings from elimination of delays (based on existing commerce)*

Item	Annual transportation savings	
	Gowanus Creek Channel	Henry Street Basin
Plan 1	$36,500	$6,000
Petroleum products	13,500	
General cargo including ores	23,000	300
Grain		2,700
Lumber		3,000
Plan 2:	39,000	6,000
Petroleum products	16,000	
General cargo including ores	23,000	300
Grain		2,700
Lumber		3,000

61. *Comparison of benefits and costs.*—A comparison of the total estimated annual evaluable benefits, based on present commerce, and annual charges for the proposed plans of improvement, together with the ratios of benefit to cost, is given in table 9. Although no definite evaluation has been made of prospective commerce, it is considered that it would generally be greater than the present commerce and the benefit-cost ratios would correspondingly increase.

[1] Not printed.

TABLE 9.—*Comparison of benefits and costs*

Plan of improvement	Annual charges			Evaluable benefits [1]	Ratio of benefits to cost
	Federal	Non-Federal	Total		
Plan 1	$12,650	$6,020	$18,670	$42,500	2.28
Gowanus Creek Channel	8,820	4,950	13,770	36,500	2.65
Henry Street Basin	3,830	1,070	4,900	6,000	1.22
Plan 2	16,580	8,780	25,360	45,000	1.77
Gowanus Creek Channel	12,050	7,080	19,130	39,000	2.04
Henry Street Basin	4,530	1,700	6,230	6,000	.96

[1] Based on present commerce.

62. *Proposed local cooperation.*—In view of the general nature of the benefits to be derived from the proposed deepening of Gowanus Creek Channel and from provision of a branch channel in Henry Street Basin, local interests should not be required to contribute toward the cost of the work. They should, however, be required to provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction and maintenance of the project. They should also be required to deepen the approaches and berths at the ship terminals, in order to secure the full advantages of the deeper channels, and to hold and save the United States free from claims for damages. Local interests are willing and able to meet these requirements. (See appendix E [1] for favorable statement from the Port of New York Authority.)

63. *Allocation of costs.*—A break-down of the division of the initial and annual maintenance costs between the Corps of Engineers and local interests is given in table 10.

TABLE 10.—*Allocation of costs*

	Plan 1	Plan 2
(*a*) Initial cost:		
Corps of Engineers	$287,000	$388,000
Local interests	141,000	206,000
Total	428,000	594,000
(*b*) Annual maintenance: [1]		
Corps of Engineers	1,500	1,500
Local interests		
Total	1,500	1,500

[1] In addition to that now required.

64. *Coordination with other agencies.*—The proposed plans of improvement were discussed with representatives of the department of public works, State of New York, the Port of New York Authority, the department of marine and aviation, city of New York, the office of the president, Borough of Brooklyn, and with the companies and navigation interests involved in the transportation of water-borne

[1] Not printed.

commerce in deep-draft vessels on Gowanus Creek Channel and Henry Street Basin. These interests are agreeable to the recommended plan of improvement. The United States Coast Guard was consulted with respect to aids to navigation.

65. *Discussion.*—Local interests proposed modification of the existing project to provide for deepening of the 26-foot project channel and the lower portion of the 18-foot channel in Gowanus Creek and the improvement of Henry Street Basin. (See pars. 27 and 28.) As a result of the preliminary examination a survey was recommended of all these proposed improvements with the exception of the proposed 15-foot channel in the upper portion of Henry Street Basin. The adverse recommendation with respect to the latter part of the improvement was based mainly on the fact that existing depths were adequate for the type of vessels using the upper portion of the basin. It was also concluded that the benefits that accrue from the Federal project in the main channel are sufficiently large to warrant local interests to undertake the relatively small amount of maintenance dredging that might be required in this portion of the basin.

66. The 26-foot project depth for the section of the channel between Twenty-eighth Street and Percival Street, although generally suitable for the class of vessels that used this portion of the waterway prior to World War II, cannot accommodate the larger and more efficient vessels now in use. The existing depths in the channel thus limit the larger and newer ships to high water navigation with consequent delays and in some cases require partial loading of cargo. Use of the waterway by deep-draft vessels only during the hours of high tide, results in congestion and increases the hazards to navigation.

67. An original request for deepening of the 18-foot project channel for its entire length was later modified to provide only for deepening the lower 500 feet of this channel. The modification was agreed upon by local interests in view of the fact that the bulkheads in the upper portion of the channel could not stand the additional depth and the additional depth was not required by the owners of the upper terminals. Deepening of the lower portion of the existing 18-foot project channel was requested to facilitate the maneuvering of vessels in and out of the Prospect Terminal Corp. wharves and to provide access for deep-draft vessels to the Seaboard Storage Corp. wharf, alongside which a depth of 25 feet has been dredged to permit the berthing of ocean-going vessels. At present the latter company brings in ships to its terminal, but only with considerable difficulty. (See par. 50.) Deepening of the 18-foot section, as requested, would aid in relieving the congestion in the waterway by facilitating the berthing of vessels at the terminals in this area and thereby reduce the hazards to navigation.

68. The request by local interests for the provision of a branch channel 30 feet deep extending 1,000 feet into Henry Street Basin was made to facilitate access to the new grain pier of the Port of New York Authority and the pier of Ira S. Bushey & Sons, Inc., along the basin. This improvement is essential for proper maneuvering of deep-draft vessels and would eliminate the hazards of grounding of vessels proceeding to these piers.

69. Two plans of improvement, generally in accordance with the desires of local interests, have been presented, namely plans 1 and 2. (See par. 54.) Both plans are identical as to scope and differ only

with respect to channel depth, that for plan 1 being 30 feet, and for plan 2, 32 feet. Plan 1 is the most economic and would have a total estimated first cost of $287,000. The total Federal and non-Federal annual charges are estimated at $18,670 as compared to estimated annual benefits of $42,500. The benefit-cost ratio is 2.28. The foregoing annual benefits, based on present commerce carried in deep-draft vessels, consist of a saving in the cost of transportation due to elimination of delays in waiting for suitable tidal heights. Plan 2 is less economic. The benefit-cost ratio is 1.77 on the basis of present commerce. On the basis of anticipated greater average commerce during the life of the improvement, the benefit-cost ratios of the foregoing plans would be considerably higher. (See pars. 41 to 44.)

70. Plan 1 is preferable. The transportation benefits to be derived from it would be widespread. The improvement would result in general benefits from the relief of congestion on the waterway by spreading the traffic of deep-draft vessels throughout the day instead of only the hours of high tide, and from elimination of the hazards of grounding. The improvement would ease the pressure on pier space in New York Harbor by making available deep-draft berths accessible at practically all times. It would facilitate the shipment of grain from the public grain elevator which is located on Henry Street Basin and owned and operated by the Port of New York Authority. In view of the general nature of these benefits, it is not considered equitable to require local interests to contribute toward the cost of the work. Local interests should, however, be required to provide without cost to the United States all lands, easements and rights-of-way for the construction and maintenance of the project, when and as required; deepen the approaches and berths at the ship terminals in order to secure the full advantages of the deeper channels; and hold and save the United States free from claims for damages as a result of the improvement.

71. *Conclusion.*—The magnitude and general nature of the benefits to be derived from deepening of the existing 26-foot project, including extension of the deepened channel into the lower portion of the 18-foot project, and from provision of a branch channel in the lower portion of Henry Street Basin justify further improvement of the waterway by the United States. Deepening to 30 feet would eliminate delays presently encountered by deep-draft vessels in waiting for suitable tidal heights, reduce congestion on the waterway during periods of high tide, and reduce accidents due to grounding.

72. The entire amount required to cover the cost to the Corps of Engineers under the recommended plan of improvement, estimated at $287,000, should be made available in the initial allotment of funds.

73. *Recommendation.*—It is recommended that the existing project for Gowanus Creek Channel, N. Y., be modified to provide for deepening the existing 26-foot channel to 30 feet at mean low water, including extension of the deepened channel about 500 feet into the existing 18-foot channel and widening of the channel at the junction with the existing 40-foot project of Bay Ridge and Red Hook Channels, and for a branch channel 30 feet deep and 150 feet wide in the lower 1,000 feet of Henry Street Basin, designated as plan 1 on accompanying maps, at an estimated first cost to the United States of $287,000 with annual maintenance of $1,500 in addition to that required under the existing project, subject to the conditions that local interests:

(*a*) Provide without cost to the United States all lands, easements and rights-of-way for the construction and maintenance of the project, when and as required.

(*b*) Deepen the approaches and berths at the ship terminals in order to secure the full advantages of the deeper channels.

(*c*) Hold and save the United States free from claims for damages as a result of the improvement.

W. W. WANAMAKER,
Colonel, Corps of Engineers,
District Engineer.

[First endorsement]

OFFICE, DIVISION ENGINEER,
NORTH ATLANTIC DIVISION,
New York, N. Y., September 14, 1949.

Subject: Review of reports (survey) on Gowanus Creek Channel, N. Y.
To: The Chief of Engineers, United States Army.

I concur in the conclusion and recommendation of the district engineer.

G. J. NOLD,
Brigadier General, USA,
Division Engineer.

LIST OF APPENDIXES MADE IN CONNECTION WITH THE REPORT OF THE DISTRICT ENGINEER

(Not printed)

A. Estimate of prospective commerce and savings.
B. Discussion of estimates of cost.
C. Digest of public hearing.
D. Terminal and transfer facilities on Gowanus Creek Channel, N. Y.
E. Statement on local cooperation.

LIST OF ILLUSTRATIONS MADE IN CONNECTION WITH THE REPORT OF THE DISTRICT ENGINEER

Figure 1. Index map.
Figure 2. General map.

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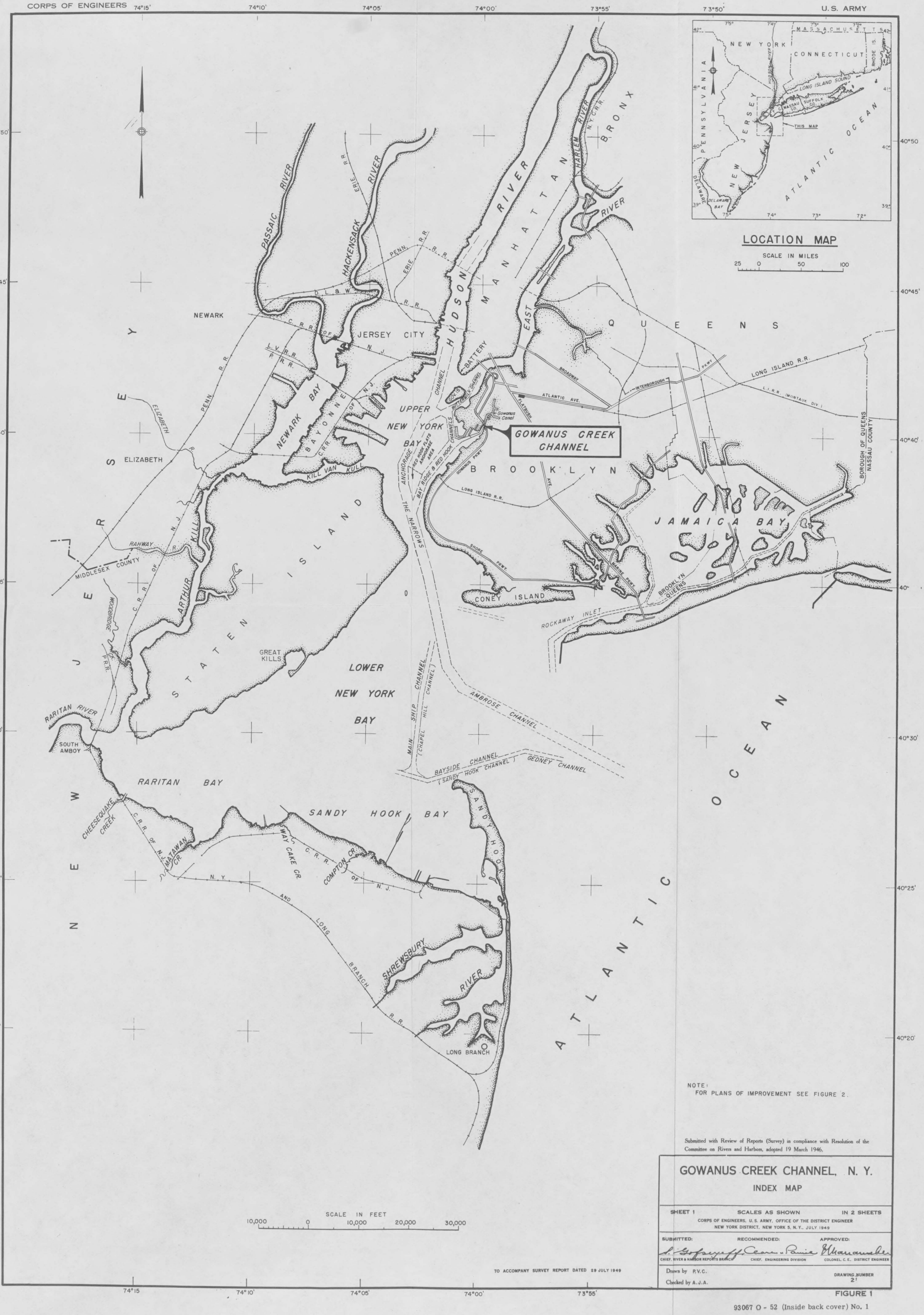
CORPS OF ENGINEERS U.S. ARMY



LOCATION MAP

SCALE IN MILES
25 0 50 100

NOTE:
FOR PLANS OF IMPROVEMENT SEE FIGURE 2.

Submitted with Review of Reports (Survey) in compliance with Resolution of the Committee on Rivers and Harbors, adopted 19 March 1946.

GOWANUS CREEK CHANNEL, N. Y.

INDEX MAP

SHEET 1 SCALES AS SHOWN IN 2 SHEETS

CORPS OF ENGINEERS, U. S. ARMY, OFFICE OF THE DISTRICT ENGINEER
NEW YORK DISTRICT, NEW YORK 5, N.Y., JULY 1949

SUBMITTED:	RECOMMENDED:	APPROVED:
CHIEF, RIVER & HARBOR REPORTS BRANCH	CHIEF, ENGINEERING DIVISION	COLONEL, C. E., DISTRICT ENGINEER

Drawn by R.V.C.
Checked by A.J.A.

DRAWING NUMBER 21

TO ACCOMPANY SURVEY REPORT DATED 29 JULY 1949

FIGURE 1

93067 O - 52 (Inside back cover) No. 1

CORPS OF ENGINEERS

U.S. ARMY

NOTES

Soundings and probings are expressed in feet and tenths and refer to the plane of mean low water, which plane is 2.33 feet below mean sea level.

Coordinates are based on a rectangular system having its origin at △ Sta. Memorial Church (U. S. C. & G. S. Sta.) and its northerly axis coincident with the true meridian.

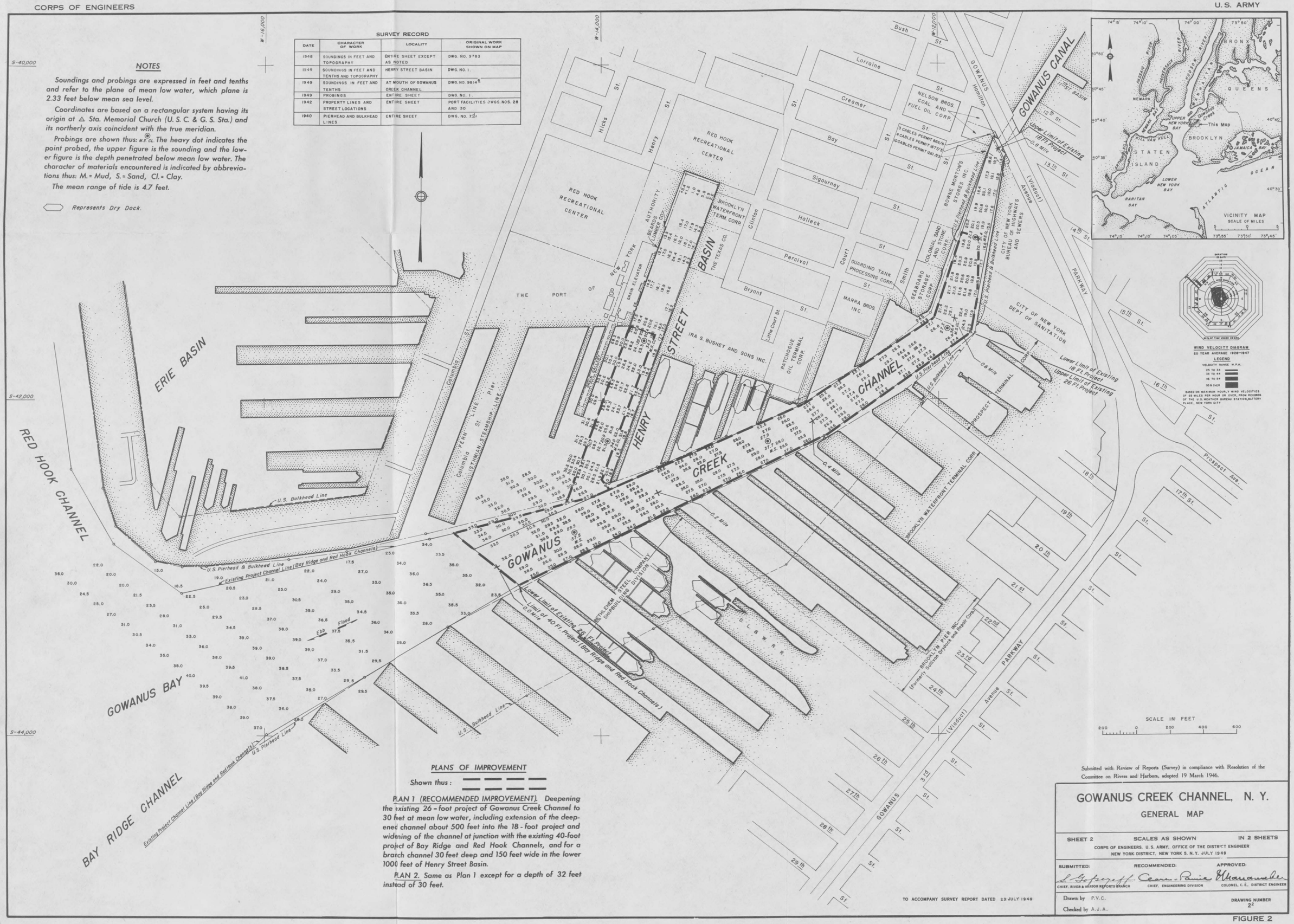
Probings are shown thus: ⊙ M.S. 6½. The heavy dot indicates the point probed, the upper figure is the sounding and the lower figure is the depth penetrated below mean low water. The character of materials encountered is indicated by abbreviations thus: M. = Mud, S. = Sand, Cl. = Clay.

The mean range of tide is 4.7 feet.

⬭ *Represents Dry Dock.*

SURVEY RECORD

DATE	CHARACTER OF WORK	LOCALITY	ORIGINAL WORK SHOWN ON MAP
1948	SOUNDINGS IN FEET AND TOPOGRAPHY	ENTIRE SHEET EXCEPT AS NOTED	DWG. NO. 9783
1949	SOUNDINGS IN FEET AND TENTHS AND TOPOGRAPHY	HENRY STREET BASIN	DWG. NO. 1.
1949	SOUNDINGS IN FEET AND TENTHS	AT MOUTH OF GOWANUS CREEK CHANNEL	DWG. NO. 9814
1949	PROBINGS	ENTIRE SHEET	DWG. NO. 1.
1942	PROPERTY LINES AND STREET LOCATIONS	ENTIRE SHEET	PORT FACILITIES DWGS. NOS. 28 AND 30
1940	PIERHEAD AND BULKHEAD LINES	ENTIRE SHEET	DWG. NO. 7



BASED ON MAXIMUM HOURLY WIND VELOCITIES OF 25 MILES PER HOUR OR OVER, FROM RECORDS OF THE U.S. WEATHER BUREAU STATION, BATTERY PLACE, NEW YORK CITY

SCALE IN FEET
200 0 200 400 600

PLANS OF IMPROVEMENT

Shown thus: — — — —

PLAN 1 (RECOMMENDED IMPROVEMENT). Deepening the existing 26-foot project of Gowanus Creek Channel to 30 feet at mean low water, including extension of the deepened channel about 500 feet into the 18-foot project and widening of the channel at junction with the existing 40-foot project of Bay Ridge and Red Hook Channels, and for a branch channel 30 feet deep and 150 feet wide in the lower 1000 feet of Henry Street Basin.

PLAN 2. Same as Plan 1 except for a depth of 32 feet instead of 30 feet.

TO ACCOMPANY SURVEY REPORT DATED 29 JULY 1949

Submitted with Review of Reports (Survey) in compliance with Resolution of the Committee on Rivers and Harbors, adopted 19 March 1946.

GOWANUS CREEK CHANNEL, N. Y.

GENERAL MAP

SHEET 2 — SCALES AS SHOWN — IN 2 SHEETS

CORPS OF ENGINEERS, U. S. ARMY, OFFICE OF THE DISTRICT ENGINEER
NEW YORK DISTRICT, NEW YORK 5, N. Y. JULY 1949

SUBMITTED:	RECOMMENDED:	APPROVED:
CHIEF, RIVER & HARBOR REPORTS BRANCH	CHIEF, ENGINEERING DIVISION	COLONEL, C. E., DISTRICT ENGINEER

Drawn by P.V.C.
Checked by A.J.A.

DRAWING NUMBER 22

FIGURE 2

93067 O - 52 (Inside back cover) No. 2